

## REMARKS

This application has again been carefully reviewed in light of the office action mailed June 1, 2004. In the office action, the examiner rejected claims 1-9, 12, 18, 19, 21-25, 28, and 31-34, allowed claims 37-41 and 44-53, and also indicated that claims 10, 11, 13-17, 26, 27, 29, and 30 would be allowable if rewritten in independent form. Claims 1-19, 21-34, 37-41, and 44-53 are presently pending and at issue in the application; of these, claims 1, 21, 37, and 44 are independent.

Claim 1 recites, in part, "a monitoring routine adapted to be executed on the processor that uses the one or more operating parameters and the characteristic curve to estimate the presence of cavitations in the device." Claim 21 includes similar recitations directed to the use of a characteristic curve to estimate the presence of cavitation. The cited art fails to disclose or suggest such use of characteristic curves to estimate the presence of cavitation.

March '506 discloses the use of sensors and a submersion factor as an indication of the risk of cavitation. See, for example, column 5, line 61 through column 6, line 2 of March '506:

While a number of alternative methods are known in the art for directly or indirectly measuring the foregoing parameters, preferred sensing devices include the following. Appropriately placed stilling well-type transducers 50 and 52 measure the relative elevation or height of headwater 24 and tailwater 26, respectively. Such measurements are used to determine the drop in head across dam 12 and for determining the submersion factor ( $\sigma$ ) of the turbine as an indication of the risk of cavitation within turbine 30.

Also by reading the text at column 12, lines 28 through 51, one can readily ascertain that March '506 teaches that cavitation is a "stressor" that may be monitored by sensors:

By way of example and not limitation, typical "stressors" that may be encountered in the operating environment of turbine equipment include vibration level, cavitation intensity, seal clearance or leakage, an inefficiency parameter, a measured mechanical stress, a calculated mechanical stress, bearing oil quality and quantity, bearing loading, bearing temperature, and the like.

Sensors 50'-64' can be configured to monitor any or all of these stressors, as desired, as well as to monitor any other stressor

capable of impacting the life expectancy of a turbine component or the entire turbine.

At column 12, lines 52 through 56, March '506 discloses that, "Hydraulic performance for a hydroelectric unit is typically characterized by a series of curves showing hydraulic efficiency as a function of gate opening or output power for a series of heads representing the expected operating range." However, March '506 discloses the use of the aforementioned curves for monitoring maintenance information and is silent on teaching the use of characteristic curve to estimate the presence of cavitation within the device. Also Fisher, Jr. et al. '446 (incorporated by reference in March '506) is completely silent on using a characteristic curve to estimate the presence of cavitation within the device.

Accordingly, March '506 simply fails to disclose that it is desirable and fails to suggest that it is even possible to use a characteristic curve in order to estimate the presence of cavitation within a device. Instead, March '506 in fact teaches away from the invention by indicating that relative submersion level should be used to indicate the presence of cavitation.

Because March '506 does not, in any manner, disclose the use of a characteristic curve to estimate the presence of cavitation, as recited in each of the rejected claims, March '506 does not and cannot anticipate any of these claims.

Also the examiner recognizes in the office action that March '506 is silent on teaching the use of a characteristic curve to estimate the presence of cavitation. However; the examiner speculates that "some type of the characteristic curve to estimate the presence of cavitation must be present for providing a system for monitoring and control of the operation of a turbine as intended", and thus it would have been obvious to one of ordinary skill to apply the characteristic curve to estimate the presence of cavitation. Saying that "some type of the characteristic curve to estimate the presence of cavitation must be present" appears to be a false assumption made by the examiner without any corresponding hint in the disclosure of March '506. March '506 teaches the use of curves for monitoring maintenance information and teaches the use of sensors to estimate the presence of cavitation. In March '506 there is not any indication that there could be a relationship between the curves and the cavitation and there is not any indication that the use of a curve is necessary, useful or even possible for estimating the presence of cavitation. March '506 teaches an old way for estimating the presence of cavitation: using sensors.

Owing to the fact that March '506 is silent on teaching the use of a characteristic curve to estimate the presence of cavitation, the examiner is mistaken in stating that "some type of the characteristic curve to estimate the presence of cavitation must be present." (Emphasis added.) In case the examiner would argue that in March '506 "some type of the characteristic curve to estimate the presence of cavitation may be present", the applicant respectfully points out that the fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. Inherency may not be established by probabilities or possibilities -- in relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessary flows from the teachings of the applied prior art (MPEP - 2112). However, March '506 teaches to use sensors for estimating the presence of cavitation and in the clear teaching of using sensors would not lead one to use a characteristic curve for this purpose. The fact that the word "cavitation" is written in the same page of the word "curve" does not lead to the fact that the two things could be in some way related.

Still further, it is clear that the prior art must make a suggestion of or provide an incentive for a claimed combination of elements to establish a *prima facie* case of obviousness. See, *In re Oetiker*, 24 U.S.P.Q.2d 1443, 1446 (Fed. Cir. 1992); *Ex parte Clapp*, 227 U.S.P.Q. 972, 973 (Bd. Pat. App. 1985). This principle holds true even if the applied art could be modified to produce the invention recited by the pending claims. See, *In re Mills*, 16 U.S.P.Q.2d 1430, 1432 (Fed. Cir. 1990); *In re Gordon*, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984) ("The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification.")


To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). MPEP 2143.

None of the secondary references make up for the deficiencies of March '506. Accordingly, none of the combinations of art relied upon by the examiner render the rejected claims obvious.

The examiner has not identified any suggestion or motivation to modify or combine the cited references, and instead appears to be improperly relying on a hindsight-based analysis.

For the foregoing reasons, reconsideration and withdrawal of the rejections of the claims and allowance thereof is respectfully requested. Should the examiner wish to discuss the foregoing, or any matter of form, in an effort to advance this application towards, allowance, the examiner is urged to telephone the undersigned at the indicated number.

Respectfully submitted,  
MARSHALL, GERSTEIN & BORUN LLP

By:   
Gregory C. Mayer  
Reg. No. 38,238  
Attorneys for Applicants

August 2, 2004

6300 Sears Tower  
233 South Wacker Drive  
Chicago, Illinois 60606-6357  
(312) 474-6300